REMARKS

Examiner James Mitchell is thanked for carefully examining and reviewing the subject patent application. The claims and the specifications have been amended in accordance with the Examiner's kind suggestions, and all claims are now believed to be in condition for allowance. The language of claims 34, 35, 37, and 38 has been amendment to better represent the Applicant's claimed invention.

DRAWINGS

Regarding the drawing objections, the claims were amended to overcome objects under 37 CFR 1.83(a). Furthermore, a figure was added and presented, Fig. 5, under Application No. 09/755,282, Art Unit 2822. The added, "new" figure, Fig. 5, was discussed at length on page 2 and page 3, in the Applicant's response, dated February 2002, to office action dated November 8, 2001. In that document, an amendment to the specifications was presented, to be added under the description of drawings and in the description of the preferred embodiments. Referring to Fig. 5, the figure description submitted was: "Fig. 5, which is a top plan view, depicts a sketch of a cutout section of a chip or die layout, showing multiple bond pads with individual interlocking grid arrays, for each conducting pad formed." Therefore, the "plurality of conductive bond pads" has been shown.

CLAIM REJECTIONS 35 U.S.C. 112

Reconsideration of the rejection of Claims 34-39 because of informalities is requested, based on the following. The language of claims 34, 35, 37, and 38 has been amendment to better represent the Applicant's claimed invention. Details of the bond pad structure were present with the added figure that was presented as Fig. 5, under Application No. 09/755,282, Art Unit 2822. The added, "new" figure, Fig. 5, was discussed at length on page 2 and page 3, in the Applicant's response, dated February 2002, to office action dated November 8, 2001. In that document, an amendment to the specifications was presented, to be added under the description of drawings and in the description of the preferred embodiments. Multiple bond pads, in Fig. 5, are presented labeled 56, 57, 58 and 59 (arrows). The original specifications were submitted as pages 18-24, and described the Applicant's claimed invention with layering in detailed. Politely disagree with the Examiner's reference to "pages 12-14", as containing the Applicant's claimed invention specifications, and with lacking "support" for the Applicant's claimed invention for passivating layers.

CLAIM REJECTIONS 35 U.S.C. 102

Reconsideration of the rejection of Claims 34-36 and 38 under 35 U.S.C. 102(b), as being anticipated by Shuie et al, (U.S. 5,923,088) hereafter referred to as Shiue, is requested, based on the following.

In reviewing Shiue, the Applicant's interlocking grid structures or array, in the Applicant's claimed invention contains several patentable differences from that of Shiue. The first is that the Applicant claimed structure, the bonding pad barrier material is specified to be TaN, instead of TiN. In addition, in the Applicant's claimed invention structure, the size and shape of the interlocking grid bond pad structures are different than those found in Shiue. The Examiner's references to Shiue's teachings and matching those with Shiue's structure, seems to appear totally different than that of the Applicant's figures 1-4. For example, the reference to Shiue's Fig. 3, conductive bond pad (30) depicts a planar layer of Al and Cu.

Furthermore, there are differences in the Applicant's claimed invention, that are not anticipated

by, nor the same, as the Shiue disclosure. In the Applicant's claimed invention, in the specifications and in Claims 34 and 38, the claimed invention provides details of the conducting bond pad formed by the interlocking grid structure or array comprised of aluminum. Also, Applicant's claim 35 and 36 specify a pure copper bond pad structure, with a passivating layer structure selected from SiO, SiN or polyimide.

Please note, that the Applicant's claimed invention Figures 1, 2, 3 and 4 are unique; and are not found in Shiue's Fig. 3, nor are there similarities.

In reference to the Applicant's Claim 38, the bond pad structure of Claim 34, wherein the conductive bond pad is formed of pure aluminum, please see the Applicant's claimed invention in Figs. 1, 2, 3 and 4 showing a "jagged" bond pad surface and interlocking grid structure, that is very different than Shuie's Figure 3, with planar layer (30) of Al and Cu.

CLAIM REJECTIONS 35 U.S.C. 103

Reconsideration of the rejection of Claim 37 under 35 U.S.C. 103(a), as being unpatentable over Shiue, as applied to Claim 34, is requested, in light of the following.

The Shuie disclosure teaches that via plugs are formed, which are electrical contact vias, and fails to disclose or suggest an interlocking grid array, as an integral part of the bond pad structure, as claimed by the Applicant. Applicant's claimed structure is not disclosed nor suggested by Shuie's Fig. 3. The Applicant's Figures 1, 2, 3 and 4 are unique; and are not obvious. Politely disagree with the Examiner statement that, "In any case, it would have been an obvious matter of design choice...", as to the exact dimensions of the interlocking grid for the bond pad structure, as precisely disclosed and taught by the Applicant's claimed invention, in structure Claim 37.

Reconsideration of the rejection of Claim 39, under 35 U.S.C. 103(a), as being unpatentable over Yoshioka (US 5,357,136), as applied to Claim 34, in combination with Edelstein et al. (US 6,133,136), is requested, in light of the following.

Yoshioka's method patent, in combination with Edelstein's, fails to disclose nor suggest Applicant's non-obvious structure, found in the Applicant's Claim 39, for conducting bond pads formed with barrier layer of TaN. Edelstein's Fig. 2 bond pad structure does not show the Applicant's claimed interlocking grid structure. Shiue's invention does not disclose TaN, and Edelstein does disclose a barrier of TaN for a totally different bond pad structure. Finally, Yoshioka's more complicated structure Fig. 2 (e), differs from the Applicant's structure build, as shown in Figs. 1-5.

Diffusion barrier layers are common practice in the Industry. Furthermore, in the Applicant's claimed invention, the key application is forming an interlocking grid array for bond pad formation.

In conclusion, for state-of-the-art advanced applications in silicon bonding technology, the applicant's claimed invention is believed to be patentable over Prior Art references, Shiue, Ede;stein and Yoshioka, because there seems to be insufficient basis for concluding that the modification of Prior Art disclosures, would have been obvious to one skilled in the art. That is to say, there must be something in the prior art or line of reasoning to suggest that the combination of these various references is desirable. We believe that there is no such basis for the combination.

Prior references fail to disclose or suggest the Applicant's non-obvious structure of an interlocking grid structure or pattern:

(a) as shown in the Applicant's claimed invention Figs. 1 through 5;

(b) the top surface of the grid directly interacts with the bonding metallurgy;

(c) the interlocking grid pattern does not teach a structure of forming a conducting via, since via resistant would increase by this structure;

(d) the Applicant's Claim 34, patentable independent claim and patentable dependent Claim 37, set forth very specific limitations;

(e) the cited prior art sketches do not teach the Applicant's claimed invention structures.

FINAL REMARKS

The Examiner James Mitchell is again thanked for carefully examining and reviewing the subject patent application. The specifications and claims have been reviewed in accordance with all the Examiner's kind suggestions, and after amending the claims in accordance with the Examiner's helpful suggestions, all claims are now believed to be in condition for allowance.

All rejected claims 34-39 are now believed to be in allowable condition, and allowance is so requested.

It is requested that should there be any problems with this Amendment, please call the undersigned Attorney at (845) 452-5863.

Respectfully submitted,

Stephen B. Ackerman,

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